Journal of Cosmology and Astroparticle Physics, 2016, vol.2016, N12

Possible evolution of a bouncing universe in cosmological models with non-minimally coupled scalar fields

Pozdeeva E., Skugoreva M., Toporensky A., Vernov S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016 IOP Publishing Ltd and Sissa Medialab srl.We explore dynamics of cosmological models with bounce solutions evolving on a spatially flat Friedmann-Lemaître-Robertson-Walker background. We consider cosmological models that contain the Hilbert-Einstein curvature term, the induced gravity term with a negative coupled constant, and even polynomial potentials of the scalar field. Bounce solutions with non-monotonic Hubble parameters have been obtained and analyzed. The case when the scalar field has the conformal coupling and the Higgs-like potential with an opposite sign is studied in detail. In this model the evolution of the Hubble parameter of the bounce solution essentially depends on the sign of the cosmological constant.

http://dx.doi.org/10.1088/1475-7516/2016/12/006

Keywords

alternatives to ination, modified gravity